Pequea Valley School District
Science

Unit 1: Studying Earth **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):
- How does Earth work together as a system in order to support life?

Keystone Eligible Content/PA Core Standard
- **3.1.10.A.** Discriminate among the concepts of systems, subsystems, feedback and control in solving technological problems
- **3.5.10.A.** Relate earth features and processes that change the earth.

Pacing: Approximate number of class sessions per unit
- 30

Tier 3 Vocabulary (Content specific vocabulary)
- Organism
- Lithosphere
- Hydrosphere
- Atmosphere
- Biosphere
- Biotic
- Abiotic
- Igneous
- Metamorphic
- Sedimentary
- Magma
- Aquifer
- Artesian Well
- Troposphere
- Stratosphere
- Mesosphere
- Thermosphere
- Greenhouse Effect
- Ozone Layer
- Ionosphere

- Biodiversity
- El Niño
- Habitat
- Tectonic Plate
- Species
- Community
- Erosion
- Hibernation
- Dormant
- Geographical Range
- Ice Ages
- Territory
- Ecosystem
- Nutrients
- Population
- Weathering

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***

- Key vocabulary
- Rock cycle
- Atmospheric layers
- Hydrosphere components

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Learners will understand that Earth is an interconnected system made of different components that all work together to allow life to persist.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Describe the components of the lithosphere, hydrosphere and atmosphere.
- Describe how these systems are connected.
- Describe how these systems are changing.

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Unit 2: Energy Resources **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):
- How can we sustainably provide for future energy needs?

Keystone Eligible Content/PA Core Standard
3.5.10.B - Explain sources and uses of earth resources.
3.8.10.A - Analyze the relationship between societal demands and scientific and technological enterprises.
3.5.12.B - Analyze the availability, location and extraction of earth resources.
4.3.12.A. - Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.

Pacing: Approximate number of class sessions per unit
- 40

Tier 3 Vocabulary (Content specific vocabulary)
- Fuel
- Hydrocarbon
- Fossil fuel
- Peat
- Lignite
- Bituminous coal
- Anthracite coal
- Petroleum
- Biomass fuel
- Nucleus
- Radiation
- Nuclear fission
- Meltdown
- Solar energy
- Passive solar heating
- Active solar heating
- Photovoltaic cell

- Hydroelectric power
- Geothermal energy
- Nuclear fusion

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***

- Key vocabulary
- Types of renewable and nonrenewable energy resources

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Learners will understand that energy resources are finite and our uses of these resources will affect future generations.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Explain sources and uses of Earth's energy resources.
- Analyze the relationship between societal demands and scientific and technological enterprises.
- Analyze the availability, location and extraction of earth resources.
- Evaluate the advantages and disadvantages of using renewable and nonrenewable resources.

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Unit 3: People in the Global Ecosystem **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):

- How is the human population impacting and being impacted by the global ecosystem?

Keystone Eligible Content/PA Core Standard

- **3.8.10.A** Analyze the relationship between societal demands and scientific and technological enterprises.
- **3.8.10.B** Analyze how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.
- **3.8.10.C** Evaluate possibilities, consequences and impacts of scientific and technological solutions.
- **3.8.12.A** Synthesize and evaluate the interactions and constraints of science and technology on society.
- **3.8.12.B** Apply the use of ingenuity and technological resources to solve specific societal needs and improve the quality of life.
- **3.8.12.C** Evaluate the consequences and impacts of scientific and technological solutions.

Pacing: Approximate number of class sessions per unit

- **30**

Tier 3 Vocabulary (Content specific vocabulary)

- Gaia hypothesis
- Hunter-gatherer society
- Agricultural society
- Industrial society
- Frontier ethic
- Sustainable development ethic
- Renewable resources
- Nonrenewable resource
- Agricultural revolution
- Germ theory
- Demography
- Carbohydrate
- Protein
- Essential amino acid
- Lipid
- Malnutrition

- Green revolution
- Cash crop
- Aquaculture
- Sustainable agriculture

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***

- Key vocabulary

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- As the human population increases, our impact on the ecosystem will increase.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Learners will be able to analyze human population growth.
- Learners will be able to describe the impact of the growing human population on the ecosystem.

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Unit 4: Land Resources and Mismanagement **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):
- What impact can human activities have on land resources?

Keystone Eligible Content/PA Core Standard
4.3.12.B. - Analyze factors that influence the local, regional, national, and global availability of natural resources.
4.5.12.D. - Evaluate waste management practices.
4.5.10.E. - Describe the impact of occupational exposure to pollutants.

Pacing: Approximate number of class sessions per unit
- 40

Tier 3 Vocabulary (Content specific vocabulary)
- Mineral
- Ore
- Bedrock
- Parent Rock
- Soil
- Soil profile
- Solid waste
- Landfill
- Hazardous waste
- Biodegradable

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***
- Key Vocabulary

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Learners will understand that resources used in daily life have to be obtained from the environment and conservation is going to determine future availability.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Learners will be able to describe the various components of land ecosystems.
- Learners will be able to analyze different waste management strategies.
- Learners will be able to analyze the impacts of the human population on land resources.

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Unit 5: Air and Noise Pollution **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):
- How do humans impact Earth's atmosphere?

Keystone Eligible Content/PA Core Standard
3.5.12.C Analyze atmospheric energy transfers
4.5.10.E. Describe the impact of occupational exposure to pollutants.

Pacing: Approximate number of class sessions per unit
- 20

Tier 3 Vocabulary (Content specific vocabulary)
- Pollutant
- Particulate
- Oxide
- Photochemical smog
- Chlorofluorocarbons
- Radon
- Emphysema
- Cancer
- Acid precipitation
- Greenhouse effect
- Ice core
- Global warming

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***
- Key Vocabulary

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Learners will understand the impacts of the human population on the atmosphere.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Learners will be able to describe various types of air pollution.
- Learners will be able to analyze the impacts of the human population on the atmosphere.

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Unit 6: Aquatic Uses and Pollution **Course: Environmental Science** **Grade: 10-12**

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s):
- What impact can human activities have on aquatic resources?

Keystone Eligible Content/PA Core Standard
3.5.10.D. Assess the value of water as a resource.
4.2.12.A. Examine environmental laws related to land use management and its impact on the water quality and flow within a watershed.
4.5.10.E. Describe the impact of occupational exposure to pollutants.

Pacing: Approximate number of class sessions per unit
- 20

Tier 3 Vocabulary (Content specific vocabulary)
- Irrigation
- Water table
- Overdraft
- Desalination
- Aeration
- Sewage
- Sewage-treatment plant
- Pathogen
- Toxic chemicals
- Heavy metal
- Eutrophication
- Thermal pollution

Know - What do learners need to **know** in order to be able to do and understand? ***List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".***
- Key vocabulary

Understand - What do learners need to **understand**? What is the **big idea**? ***List broad concepts or "big ideas" in a statement of enduring understanding.***

- Learners will understand the impacts of the human population on water resources.

Learning Outcome - What do learners need to be able to **accomplish** by the unit's end? ***List skills and competencies.***

- Learners will be able to describe the various types of uses of aquatic resources.
- Learners will be able to describe the various types of aquatic pollution.
- Learners will be able to analyze the impacts of the human population on aquatic resources.